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Plant Health
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Plant Protection
and Quarantine

Asian Gypsy Moth Emergency Program Manual

**United States
Department of
Agriculture**



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Asian Gypsy Moth
Emergency Program Manual

Animal and
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Domestic and
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Operations

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INTRODUCTION

Orientation to the Asian Gypsy Moth (AGM) Project

Action Statement

The information contained in this emergency program manual is intended for use when surveying, regulating, and controlling infestations of AGM (*Lymantria dispar*). The manual provides technical and general guidelines for detection and follow-up delimiting survey activities, and regulating and inspecting ships considered AGM suspect. Also, the manual summarizes the eradication project which is being conducted in Oregon and Washington during 1992.

History

The AGM (*Lymantria dispar*), a forest pest, was found in traps in Oregon and Washington and in British Columbia, Canada. If AGM were established in the United States, this exotic pest could devastate forests, woodlands, and residential landscapes. Because of its different behavioral characteristics, the AGM can potentially cause more damage than the European gypsy moth that is established in eastern North America. The AGM female can fly up to 25 miles, and larvae are more diverse in their feeding habits. They feed on conifers as well as hardwoods.

The Asian strain of the gypsy moth is native to Asia. It was first identified in North America late in 1991 near the Port of Vancouver in British Columbia. During the fall of 1990 and all of 1991, Agriculture Canada found that ships moving from Asiatic ports in Eastern Russia were sometimes infested with AGM egg masses. On several occasions, AGM larvae were observed blowing or ballooning on silken threads towards shore from the ships. Some of these ships also docked at U.S. ports. During 1991, the Animal and Plant Health Inspection Service (APHIS) inspected several high risk ships on arrival at ports in the Pacific Northeast. Two of these ships were found to be contaminated with AGM egg masses.

Based upon the experiences of Agriculture Canada and the U. S. Department of Agriculture (USDA) in Vancouver, British Columbia; Tacoma, Washington; and Portland, Oregon; it is possible that introductions such as ballooning larvae may have occurred at other U.S. ports. And, it is a fact that several AGM contaminated ships visited U.S. ports during 1990 and 1991.

Infestations of AGM have been confirmed in Vancouver, British Columbia; Tacoma, Washington; and Portland, Oregon. Currently, Canada and the United States are planning and implementing projects to eradicate these infestations.

Impact:

If established in the United States and Canada, each AGM female could lay egg masses that in turn could yield hundreds of larvae with appetites for more than 500 species of trees and shrubs. AGM defoliation would severely weaken trees and shrubs, killing them or making them susceptible to diseases and other pests. Additionally, larvae silk strands, droppings, destroyed leaves, and dead moths would be a nuisance in homes, yards, and parks.

Since AGM females can fly distances up to 25 miles, infestations can spread rapidly. Also, infestations can occur in roadless areas that are difficult to survey, increasing the probability that infestations could become well established and widespread before being discovered. Additionally, the AGM affects a broader variety of trees and shrubs. It is estimated that if the AGM became established in the western United States where they would affect primarily larch and hardwoods, economic losses to larch could exceed \$1 billion over 40 years.

The economic impact of AGM becoming established in the United States would be devastating, severely disrupting the multibillion dollar timber and forest products industry. Parks, woodlands, and residential landscapes would be threatened. Pesticide usage and annual control costs would increase. Foreign countries would embargo products from infested areas. U.S. exporters of agricultural commodities would lose markets worth millions of dollars, diminishing the international competitiveness of the United States.

Pest Information

Comparing Gypsy Moth Pests:

The AGM is similar to the European gypsy moth that is known to occur in the Northeastern United States and Southeastern Canada. Like European gypsy moth, AGM prefers forestal habitats and can cause serious defoliation and deterioration of trees and shrubs. The gypsy moths present in the Northeast have more than 250 known host plants but prefers oak. The AGM has a broader host range, including larch, oak, poplar, alder, willow, and some evergreens.

AGM females are active fliers, unlike the flightless females of the European gypsy moth. The ability of AGM females to fly long distances up to 25 miles makes it probable that the AGM could quickly infest and spread throughout the Western United States.

In the East, gypsy moths defoliate approximately 4 million acres each year, causing millions of dollars worth of damage. If AGM became established in the forests of the Northwest, the damage could be much more extensive and costly.

Life Stages:

The AGM matures through four life stages: egg, larva (caterpillar), pupa (cocoon), and moth.

AGM egg masses may be found on tress, stones, walls, logs, outdoor furniture, and other outdoor objects. Each egg mass can contain more than 1,000 eggs. The mass is covered with buff or yellowish fuzz from the abdomen of the female. The velvety egg masses average 1 1/2-inches long and 3/4-inch wide, but they may be as small as a dime.

In the Northwest, AGM eggs begin hatching into larvae in the spring. AGM larvae stop feeding when they enter the pupal stage. This stage begins in June or July, depending on weather and temperature. Adult moths emerge from the dark brown pupal cases in 10 to 14 days.

Adult males have grayish-brown wings, and a 1 1/2-inch wingspan. Adult females are white and larger, with wingspans up to 3 1/2-inches or more. AGM only mate and lay eggs during the 3-4 week adult moth stage; they do not feed. Eggs are laid between July and September, depending on weather and location.

Spread of Infestations:

Infestations of AGM are spread in several ways.

- Adult female moths may fly to noninfested areas to lay eggs, thus spreading the infestations.
- Newly hatched AGM larvae may climb to tree crowns, where the wind picks up their silken thread and carries them to other areas.
- People can inadvertently transport egg masses. Gypsy moth egg masses are tolerant of extremes in temperature and moisture. They travel well on logs, outdoor furniture, pallets, containers, and on the superstructure of ships.

Goals

Implement a cooperative, emergency program that will eradicate the AGM in Washington and Oregon and detect any other infestations. Detect and identify AGM infested areas, control and prevent the spread of AGM to noninfested areas of the United States, and eradicate AGM in the infested areas.

Plans for 1992:

- Conduct three aerial applications of *Bacillus thuringiensis* (Bt) over the designated areas for eradication in Washington and Oregon.
- Conduct delimiting surveys surrounding the areas for eradication.
- Conduct detection surveys at U.S. ports that were exposed to AGM suspect ships.

INTRODUCTION

Who's Involved

Introduction

The AGM program is very much a cooperative one. The United States and Canada have established a working group to ensure that the two countries develop common approaches, establish similar policies, and coordinate and share information.

As part of the coordinated control efforts, APHIS will inspect foreign ships for AGM egg masses. Additionally, State and Federal project workers will monitor detection traps in areas of the United States that were exposed to contaminated ships. Likewise, Agriculture Canada is inspecting ships before they enter their ports and prohibiting ships to dock if they are found infested with AGM egg masses. Agriculture Canada will monitor AGM infested areas in Vancouver, British Columbia, with traps to detect AGM.

Project Management Team

APHIS, the Forest Service (FS), the Oregon and Washington State departments of agriculture, and various other Federal and State agencies are coordinating their efforts in controlling the AGM. An AGM Project Management Team (PMT) was formed to develop and manage a coordinated, cooperative survey and the plan for eradication. The PMT consists of representatives from the cooperating agencies.

Science Panel

The PMT's technical support comes from the AGM Science Panel consisting of representatives from Federal and State agencies and from the academic community. The Science Panel analyzes the project's biological and technical information and provides recommendations to the PMT.

Project Coordinator

Gary Smith, Plant Protection and Quarantine (PPQ) Officer in Charge (OIC), in Portland, Oregon, is the APHIS Project Coordinator. He directs the PMT to manage the survey and the eradication project in Oregon and Washington.

Public Information Team

Larry Hawkins, Information Specialist in APHIS, Legislative and Public Affairs, is responsible for providing accurate information and protecting the image of the project before the media and public.

Coast Guard

The U.S. Coast Guard (CG) will assist PPQ to exclude AGM contaminated ships from entering U.S. ports. PPQ OIC's should contact the Captain of the Port (local CG representative) to discuss the process of operation regarding the following points.

- The CG will notify the local PPQ office when an AGM suspect ship reports in. The alert list of AGM suspect ships will be entered in the CG's lookout data base (MSIS) as a vessel of particular interest (VPI). Ships are required to report to the CG within 24 hours of entering U.S. waters (3 mile limit). When AGM suspect ships report in, the CG will provide advanced notice of arrival information on the high risk ships.
- The CG will provide the capability for in stream boarding. On request from PPQ, the CG will transport PPQ Officers to the high risk ship, and provide a suitable platform to board the ship. CG units at ports where they are without sufficient resources to transport PPQ Officers, will provide PPQ with a list of certified, commercial marine taxi or launch services.

Customs

The U.S. Customs Service (Customs) will assist PPQ to exclude AGM contaminated ships from entering U.S. ports.

Customs has alerted all ports of APHIS' need for assistance when infested ships are found. Upon a Request for Customs Action, PPQ Form 227, Customs will withhold clearance, either coastwise or foreign.

Customs will follow procedures for withholding clearance contained in Customs Directive (CD) 3120-014, dated January 30, 1992.

Surveyors, Trappers,
Inspectors

PPQ Officers, State employees, FS employees, seasonal employees (State and Federal) who will conduct the field activities. At designated ports of entry, PPQ

Officers will be inspecting AGM suspect ships. In designated survey areas, individuals will be conducting detection surveys and follow-up delimiting surveys. In designated areas for eradication, individuals will be conducting treatments and surveys.

This manual will be used primarily by these employees, with the exception of those conducting field activities in Oregon and Washington. The secondary users of the manual are Federal, State, county, and local regulatory officials, private industry, and temporary employees assigned to program activities.

Otis Diagnostic
Laboratory

Personnel at the Otis Diagnostic Laboratory will be analyzing and identifying submitted specimens.

Specimens will be submitted along with a Gypsy Moth Identification Work Sheet to the following address:

Otis Diagnostic Laboratory
USDA, APHIS, PPQ
Otis Methods Development Center
Building 1398
Otis ANGB, MA 02542-5008

Regional Survey
Coordinators

Your Regional Survey Coordinator must be immediately contacted when a suspect AGM is found.

| If you are surveying in the Region of: | Then your Regional Survey Coordinator(s) is: |
|--|---|
| Northeast | Ray Hite FTS 943-2110 Comm. 614-469-2110 Terry Goodman Comm. 203-265-2110 |
| Southeast | Gary Clement Comm. 601-863-1980 |
| South Central | Gordon Tween FTS 529-2610 Comm. 512-548-2610 |
| Western | Richard Jackowski FTS 460-3220 Comm. 916-551-3220 |

INTRODUCTION

How to Use This Manual

Use the AGM Emergency Program Manual on the job as a reference when conducting surveys and regulating ship movements.

Manual's Structure

Each divided section is independent, containing the step-by-step methods for surveying and inspecting. The three surveys established for AGM are detection, follow-up delimiting, and indirect. The inspection procedures in the Regulatory section are specific to ships at designated ports of entry. The eradication project for 1992 is summarized in the Control section. Specific procedural guidelines for the eradication project are being followed locally in Oregon and Washington.

Each section has an Introduction which contains general information relating to the section's main content.

The Overview is a list of steps described in the section. It can be used as a checklist for those who are familiar with how to do the steps.

The Appendixes are used as they relate to the other sections of the manual. In some places, an Appendix is referenced; while in other places, it is assumed that you accessed an Appendix to get the necessary information.

If the Contents is not specific enough, use the Index to find a topic and its page number.

Related Documents

The following documents are related to and support the AGM project:

- Declaration of Emergency Because of Asian Gypsy Moth, Federal Register, Docket No. 92-020, March 12, 1992
- Asian Gypsy Moth 1992 National Survey Plan, Draft IX, April 1, 1992
- 1992 Asian Gypsy Moth Eradication Project Organizational Guidelines
- The Asian Gypsy Moth Report of the AGM Science Advisory Panel Recommendations, March 3, 1992

- Gypsy Moth Suppression and Eradication Projects--Final Environmental Impact Statement as Supplemented - 1985 (FEIS)
- Environmental assessments
- Appalachian Integrated Pest Management FEIS 1989
- Wildlife and Fisheries Regulations (Endangered Species Act)
- Aerial Application Manual
- State and Federal Cooperative Agreements and Work Plans
- State laws which allow access to private property
- Don't Move Gypsy Moth (Program Aid 1329)
- Insecticide Labels and Labelling
- Material Safety Data Sheets
- APHIS Safety and Health Manual No. 203, dated May 27, 1983
- USDA Departmental Regulation No. 4400-1, Departmental Occupational Safety and Health Management, dated January 6, 1983
- USDA Hazard Communication, A Guide for Federal Agencies, August 1987
- USDA Departmental Regulation No. 4400-2, Hazard Communication Programs, dated October 14, 1986
- USDA Departmental Regulation No. 5023-1, Chemical Hazard Communication, dated October 10, 1986

Reporting Problems

If you want to suggest an improvement or to identify a problem with the content of this manual, complete and mail the Comment Sheet at the back of this manual. If the problem is urgent, call Dawn Wade of the Professional Development Center at (301) 663-0342.

If you disagree with policy in this manual, contact Domestic and Emergency Operations, through channels. Ask to speak to Milton C. Holmes at FTS 436-8247 or Commercial (301) 436-8247.

INTRODUCTION

Preventative Safety Measures

Safety measures involving personnel, the public, and the use of equipment are the responsibility of all individuals working on the AGM project. Supervisors must advise employees of safety and health regulations and notify employees of known hazardous conditions. Employees must comply with all safety and health regulations. When necessary, wear protective equipment and report hazardous situations to your supervisor. Contact your supervisor immediately when an accident or personal injury has occurred.

Safety Reminders
When Trapping

- Beware of aggressive animals (for example, dogs, bulls, etc.) near the trap site.
- If trapping in an area where Lyme's disease is common, wear protective clothing against deer ticks. Inspect yourself after servicing traps in a deer tick area. Prevention is the only way to avoid getting Lyme's disease. Contact your local public health officials for other preventative measures to take.
- Avoid contact with poisonous plants.
- Carry plenty of drinking water.
- Wear proper clothing (long pants, sturdy shoes or boots).
- In areas with poisonous snakes, wear snake leggings and carry a snakebite kit.
- Use gates for entering properties; watch for electric fences!
- Respect resident's property.

Vehicle Safety
Reminders

- Check the condition of the vehicle before starting daily activities.
- Check to see that passage is clear before backing up the vehicle.
- Select a safe parking place for the vehicle while servicing traps or when leaving the vehicle.
- Drive slowly when roads are unfamiliar, winding, narrow, or unpaved.

- Always use your seat belts.
- Obey the posted speed limits. DON'T SPEED!
- Keep your vehicle free of debris and unsecured items.
- Tell your supervisor immediately whenever you're involved in an accident.
- Carry wooden blocks to block your tires when parking on a steep slope.
- Carry sufficient repair tools (jack and lug wrench) and safety equipment (flares and first aid kit).

INTRODUCTION
Restrictions

Authorization

On March 12, 1992, the Secretary of Agriculture issued a Declaration of Emergency, authorizing transfer of funds for a cooperative AGM survey and eradication project. APHIS and FS will be cooperating with State agencies to detect and eradicate AGM infestations.

Under the authority of the Organic Act (7 U.S.C. 147a), the Department may cooperate with the States or others to carry out measures to suppress or control the spread of plant pests.

No State or Federal quarantines will be promulgated at this time. If additional AGM are detected during 1992, the policy on AGM quarantines will be reevaluated.

Notice

Procedures in this manual involve the use of insecticidal products registered under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), as amended. Precautions on the insecticidal label and all instructions in this manual must be carefully followed.

PPQ personnel may not make any warranty or representations, expressed or implied, concerning the use of these insecticides and shall not be responsible for any loss, damage, or injury sustained as a result of the use of any insecticide as specified in this manual.

The use of trade names in this manual does not imply an endorsement of those products or of the manufacturers thereof by Federal/State pest control programs.

SURVEY

Introduction

Overview

The Survey section of this manual explains procedures for conducting the following activities associated with Asian gypsy moth (AGM) surveys:

- Detection Survey
- Follow-up Delimiting Survey
- Indirect Survey

Exemption

Special surveys are established for Washington and Oregon. Since AGM was detected in Washington and Oregon during 1991, special surveys are planned at all high-risk areas in these States. Activities conducted in Washington and Oregon are not covered in this manual.

Funding of Survey
Activities in 1992

All proposed AGM survey activities and the associated costs will be in addition to and completely separate from the gypsy moth (GM) program activities.

Materials Needed

Use the following listed items to conduct surveys for AGM. Note that you may not need all the items. Survey supplies, lures, and traps will be purchased and distributed to work stations.

- Colored pencils for mapping moth finds
- County or city road maps
- Delta traps, milk carton traps, black light traps
- First aid kit
- Grid overlay, calipers, or ruler
- Disparlure (sex attractant for pheromone traps)
- State trapping form
- Gypsy Moth Identification Work Sheet
- Staples and staple gun, or string (for hanging traps)
- Small backpack
- Snake leggings
- Surveyor's flagging ribbon (marking tape), crayon, or marker for marking trap locations
- Tick repellent
- Permanent markers or grease pencils for numbering traps

SURVEY
Detection Survey

Introduction

Purpose:

To locate, by trapping, isolated AGM infestations; to determine when and where further delimiting surveys are required; and to identify areas where eradication projects will be required.

It is critical to detect AGM infestations at the earliest possible date and eradicate them before they begin to spread.

Time of Survey:

In general, the survey will be conducted from late spring through late summer depending upon local climatic conditions. Refer to Appendix 2 for the survey period assigned each survey area.

Overview:

The following overview of the steps for the Detection Survey can be used as a checklist for those familiar with how to do the survey.

1. Prepare to conduct a detection survey.
2. Plot prospective trap sites on a map.
3. Set traps and mark actual positions.
4. Service the traps.
5. Submit AGM suspects.
6. Remove traps.
7. Report survey results.
8. Complete survey maps.

Prepare to Conduct
a Detection Survey

For the survey work conducted in Fiscal Year 1992, survey areas have been designated, the number and type of traps have been determined, and the survey periods have been established. Refer to Appendix 2 for a summary of the survey areas, trapping requirements, and times to survey.

Step 1--Designate and Categorize Survey Areas:

The area for conducting a detection survey is determined by risk of potential introduction. Not all areas within a State have the same potential for becoming infested because of differences in habitat, host availability, and proximity of potentially infested importing ships. The major criterion used in designating survey areas was

the exposure of a U.S. port to high risk ships which had visited Far East Russian ports during July, August, or September.

Survey areas for 1992 are locations where AGM infestations may have been introduced by AGM contaminated ships entering ports and waterways. The survey areas are listed in Appendix 2 and are divided by the following geographical characteristics:

- U.S. ports and land areas along waterways located **outside** of the area generally infested with the European strain of the gypsy moth.
- U.S. ports and land areas along waterways located **within** the areas considered to be generally infested with the European strain of the gypsy moth.

Step 2--Determine Trap Requirements:

The number and type of traps needed for the detection surveys conducted in 1992 are summarized in Appendix 2. A detailed description of the traps and how to assemble them is in Appendix 3.

| If the survey area is located: | Then use: |
|--|---------------------------------------|
| Outside of areas generally infested with the European strain of the gypsy moth | Pheromone traps |
| Within areas considered to be generally infested with gypsy moth | Black light traps and pheromone traps |

Step 3--Set Time to Survey:

The time to conduct detection surveys in 1992 is summarized in Appendix 2.

| If the survey area is located: | And is located: | Then survey: |
|--|----------------------------|-----------------------------|
| Outside of areas generally infested with the European strain of the gypsy moth | South of Norfolk, VA | May 1 through September 30 |
| | South of San Francisco, CA | |
| | North of San Francisco, CA | July 1 through September 30 |
| Within areas considered to be generally infested with gypsy moth | North or South | |

Step 4--Determine Personnel Needs:

Divide the trap total by the number of traps a trap tender can service under the conditions experienced in a specific State or location. A national average is 400 traps per trap tender for detection survey.

Formula: $\text{Trap total} / 400 = \text{Total number of trap tenders required}$

Step 5--Prepare a Trapping Budget:

In 1992, APHIS will fully fund (100 percent) the AGM detection surveys.

The following expenses are budgeted for.

- Trap tenders' hours
- Transportation costs for trap tender
- Trap and lure cost
- Miscellaneous materials (staples, staplers, maps)

Plot Prospective
Trap Sites on a Map

Step 1--Determine Trapping Density:

Use the following table to determine how many traps must be plotted for a given survey area.

The high risk ports in Washington and Oregon will install 16 traps per square mile within a 20 mile radius of the dock area.

Pheromone Traps--

| If the survey area is located: | And the risk level is: | Then plot trap locations: |
|--|------------------------|--|
| Outside of areas generally infested with the European strain of the gypsy moth | High | <u>Ports</u> <ul style="list-style-type: none"> ● 9 traps/sq. mile within a 1 mile radius of the dock area (28 traps) ● 4 traps/sq. mile out to a 5 mile radius (302 traps) ● Up to 330 traps <u>Waterways</u> <ul style="list-style-type: none"> ● 4 traps/sq. mile along waterways and 5 miles inland ● Maximum of 40 traps/linear mile of waterway (i.e., 20 on each side) |
| | Low | <u>Ports</u> <ul style="list-style-type: none"> ● 4 traps/sq. mile out to a 5 mile radius of the dock area ● Up to 314 traps <u>Waterways</u> <ul style="list-style-type: none"> ● 4 traps/sq. mile along waterways and 5 miles inland ● Maximum of 40 traps/linear mile of waterway (i.e., 20 on each side) |
| Within areas considered to be generally infested with gypsy moth | High or low | <ul style="list-style-type: none"> ● 4 traps/sq. mile along waterways and 5 miles inland ● Maximum of 40 traps/linear mile of waterway (i.e., 20 on each side) |

Black Light Traps--Black light traps (BLT's) will be placed only in survey areas located within areas considered to be generally infested with gypsy moths.

Plot BLT's 1/2 mile apart around port environs, up to 10 BLT's for each port.

Step 2--Plot Prospective Trap Sites:

Plot trap sites in advance of the survey period (late winter/early spring). Use a method that will ensure an even distribution of traps within the survey area. For example, use a grid overlay, a ruler, or calipers to plot trap locations on a map. Planned grids allow you to compare results from site to site. Using square mile blocks on most county or city maps is also an acceptable method.

Consider the scale of the map and the trapping density required (traps per square mile). The scale on some county maps is appropriate for the detection survey.

NOTE: You have the freedom to determine unfavorable habitats for AGM and exclude those areas from trapping. Examples of areas that most likely will not support AGM populations might be higher mountains, ridges, sheltered areas, uniform conifer stands, and downtown cities.

Step 3--Number the Traps:

Once you have plotted trap sites on a map, consecutively number the traps within each county. Mark the trap number on the map and on the bottom of the traps with a permanent marker or grease pencil.

If you add traps to positive trap sites, number the additional traps with the same number as the supplemented trap, plus a letter. For example, if trap 25 is supplemented, the first additional trap would be 25a, the second would be 25b, and so on.

Set Traps and Mark
Actual Positions

Step 1--Determine When to Set Traps:

It is critical to set pheromone traps early in the season. Therefore, set the pheromone traps before male moths emerge. Male emergence will vary in an area by up to 10 days, depending on local climatic conditions and elevation. Often, males begin emerging a few days before females.

HINT 1: For traps being set in survey areas within areas considered to be generally infested with the European strain of the gypsy moth, you can find out when gypsy moths emerged and were trapped in previous years.

HINT 2: Pheromone traps should be baited at least one week before they are set. Lures exposed to air before use are more effective. Lures are effective for up to a year of field exposure. Therefore, placing traps early does not harm a trap's effectiveness.

Step 2--Determine Where to Set Traps:

Select where the traps will be set at or about the plotted sites already marked on a map. Find a position as close as possible to the plotted site.

Many factors determine where to set a trap in a given survey area. The distance between traps depends on the required trap density and the local conditions. Place the traps in as uniform array as possible. Consider the general rules for setting traps listed in Appendix 3.

NOTE: You have the flexibility to move the trap up to one-third the inter-trap distance to provide the best position (access and host) and to eliminate omitting traps. For example, if the detective grid is 4 sq. miles, the inter-trap spacing is 2,640 ft. Therefore, the trap can be placed anywhere within a radius of 880 ft. $(2,640 \div 3)$ around the original point plotted on the map.

Step 3--Complete a Trap Record Sheet:

Once the trap is set in a position, complete a trap record sheet. Describe the actual trap site and its specific position. Trap record sheets will be provided locally.

Also, make corrections to the survey field map if the trap site was adjusted in the field.

Step 4--Mark Actual Trap Positions:

Only when necessary, mark actual trap positions to expedite tending the trap. In urban areas where streets are named and houses are numbered, use the house address for identifying traps. Do not mark trap locations with ribbons or marking crayons in urban areas. Also, use restraint in marking roadside rest areas, picnic areas, tourist attractions, and other high use areas where the ribbon will detract from the site's appearance.

When it is necessary to mark a trap position, use plastic flagging ribbon or marking crayon. Brightly colored plastic tape (fluorescent orange) is the best flagging ribbon. The marking crayon must be sufficiently soft to mark wet trees.

Tie a piece of flagging ribbon to a telephone pole, tree trunk, or other suitable object at the roadside. The ribbon should be visible from the road when approaching from either side. Place a small piece of flagging ribbon near the trap.

Service the Traps

Step 1--Determine When to Service Traps:

Service traps as often as possible. Experience has shown that vandalism of a trap usually occurs soon after it is set. Therefore, the first servicing should be before expected male flight.

If the trap is missing or has been vandalized at the first servicing, a new position can be selected. If the position changed, be sure to change the trap record sheet to show the new site.

BLT's will need to be serviced daily because the battery must be charged and the specimens collected. Check the trap first thing in the morning. At that time, retrieve any specimens and take the battery in for charging. In the evening, replace the battery and turn the light on.

Service the traps following the schedule listed in the table below.

| If the survey area is located: | And the kind of trap is: | Then service the trap: |
|--|--------------------------|---|
| Outside of areas generally infested with the European strain of the gypsy moth | Pheromone | Once a month |
| Within areas considered to be generally infested with gypsy moth | Pheromone | <ul style="list-style-type: none"> ● Once a month ● More frequently during peak moth activity |
| | BLT | Daily |

Step 2--Plan for Servicing Traps:

Plan your route before leaving the office to eliminate overlapping travel.

Gather all the supplies you will need such as, replacement traps, trap record sheets, staple gun and staples, and permanent markers.

Step 3--Service the Traps:

Look at the overall condition of the trap and look for suspect moths in the trap. Refer to Appendix 3 for information on how to open and check traps.

NOTE: Other exotic pests are attracted to gypsy moth traps.

Replace badly damaged or missing traps. Number the replacement trap with the same number as the original trap plus an indicator that represents it as a replacement. For example, 416-R where "R" represents replacement. Also, mark the date on the new trap.

Carefully remove and replace traps which contain suspect moths. Use the same numbering scheme described above.

Record the date, time, and exact location of recovery on the local trap record sheet. Mark on the trap the date the trap was set and the date the trap was serviced. Immediately notify your supervisor.

Step 4--Record the Results of Service:

Write the following information on the trap record sheet: Trap site including descriptive information needed to help locate traps, trap numbers, county, trapper's initials, date trap was set, and each date the trap is serviced.

Immediately report suspected AGM to your Regional Survey Coordinator. Include the time of recovery and the general survey area.

Submit AGM Suspects

Step 1--Record the Results of the Recovery:

Trap--Record on the bottom of the trap the date, time, results, and any pertinent observation or action taken. Also, record the last date the trap was serviced so that the trapping period is known.

Trap Record Sheet--Record the date and all circumstances about the recovery of suspect moths on the trap record sheet.

Gypsy Moth Identification Work Sheet (GMIWS)--Complete a GMIWS which will accompany the suspect AGM. Refer to Appendix 4 for instructions on how to complete the work sheet.

Step 2--Package the Traps:

Delta Traps--Place the entire, assembled trap in a sturdy, cardboard box. Pack around the trap with crumpled paper. Do not use loose packing material that would become entangled on the sticky surface of the trap.

Milk Carton or Black Light Traps--All specimens recovered from a single trap at one service should be packaged together. The specimens can be separately placed in glassine or paper envelopes, or can be placed together in a small paper bag. If there is a large number of specimens recovered from a single trap, multiple bags or envelopes can be used. Do not use plastic bags because the specimens will rot.

Label the envelopes or paper bags with the date of servicing, the date of the last previous servicing, the trap number, and its location.

Place the bags or envelopes in a sturdy, cardboard box. Carefully pack them in the box so the specimens will not break during mailing.

NOTE: The Otis Methods Development Center will supply small paper bags and cardboard boxes for submitting specimens to survey areas located within areas considered to be generally infested with the European strain of the gypsy moth.

Step 3--Mail Traps and Work Sheets:

1. Place the original (Otis Diagnostic Laboratory) and part 2 (Return to Submitter) of the GMIWS in the box with the specimen(s).
2. Mail the trap(s) or specimen(s), and two parts of the work sheet to the following address, using first class mail service.

Otis Diagnostic Laboratory
USDA, APHIS, PPQ
Otis Methods Development Center
Building 1398
Otis ANGB, MA 02542-5008

3. Send part 3 (Intermediate Identifier) of the work sheet to an intermediate identifier or to a coordinator or supervisor.

4. Retain part 4 (Submitter).

Remove Traps

At the end of the survey period, remove all set traps. Look for missing traps, and examine those found for AGM.

Step 1--Remove Traps From Sites:

Look for the trap number. Rewrite the number if it has faded. This will help you identify the traps later, if necessary. Record the date the trap was removed on the local trap record sheet.

Place the traps in a bag. Along with the trap, remove all the materials used to set and mark it (string, staples, wire, and flagging tape).

Step 2--Check the Traps for Suspect Moths:

Make a final check for suspect moths in all the collected traps. If you find suspect moths, follow the steps for submitting AGM suspects.

Step 3--Dispose of Traps:

Flatten empty, used traps. Dispose of the traps by burning them in an incinerator or by burying them at a sanitary landfill.

Report Survey
Results

The survey results will be reported into the National Agricultural Pest Identification System (NAPIS). All State Survey Coordinators and some OIC's have the capability to enter data into NAPIS. Data should be entered using the formats in Appendix 5. It is a joint responsibility of the Survey Manager, the OIC with responsibility for Cooperative Agricultural Pest Survey (CAPS), and the State Survey Coordinator to insure that all data are properly assembled and presented for entry to NAPIS. In addition to the data specified below and in Appendix 5, other data useful to local or Regional staff may be entered into NAPIS at the discretion of program participants.

Positive survey results (AGM is found) will be reported immediately by Otis Methods Center to:

1. The site submitting the sample
2. The appropriate Regional Office
3. The Domestic and Emergency Operations Staff

A record for every positive find will be entered into NAPIS within 24 hours of notification.

Negative survey results will be summarized and reported annually into NAPIS. Do not report negative summary data until all data are collected and summarized by county. Refer to Appendix 5 for instructions on reporting survey data into NAPIS.

Complete Survey
Maps

Record all positive trap recoveries on the survey field map. Survey maps with positive and negative finds will be used for postseason review and decision making.

SURVEY
Follow-up Delimiting Survey

Introduction

Purpose:

To determine if an infestation is present and the approximate size of the infestation.

Time of Survey:

If a suspect moth is trapped in a high risk area, plan to immediately conduct a delimiting survey when it is at or before peak flight activity.

The suggested dates for peak flight activity are before June 15 for ports South of Norfolk, VA, and San Francisco, CA, and before August 1 for ports North of Norfolk, VA, and San Francisco, CA.

A delimiting survey would not be conducted immediately if suspect moths were trapped after peak flight activity.

Overview:

The following overview of the steps for the Follow-up Delimiting Survey can be used as a checklist for those familiar with how to do the survey.

1. Plot prospective trap sites on a map.
2. Set traps and mark actual positions.
3. Service the traps.
4. Submit AGM suspects.
5. Remove traps.
6. Report survey results.
7. Complete survey maps.

Plot Prospective
Trap Sites On a Map

Examine the survey field map from the detection survey showing positive trap sites. When plotting trap locations on a new map, consider the scale of the map and the required trapping density.

The scale on a U.S. Geological Survey, 7 1/2 minute topographic map (1:24,000) or similar large scale map is appropriate for conducting a delimiting survey. On a city map, the scale should be at least 2 inches per mile. A recent map showing forestal areas and new construction is preferable. Maps of a different scale may be used.

Step 1--Determine Trapping Density:

Center the grid on the positive trap site(s). Plot trap locations at 16 to 36 traps per sq. mile in a delimiting area of 1 to 4 sq. miles beyond the trap site, or a 1/2 to 1 mile boundary. If a number of positive traps are spread out, it will be necessary to trap a larger area. The end result is that delimiting trapping should extend at least a mile beyond a positive trap site.

Use the following table as a guide for inter-trap spacing (distance between traps).

| Traps per square mile: | Inter-trap spacing in feet: |
|------------------------|-----------------------------|
| 4 | 2,640 |
| 9 | 1,760 |
| 16 | 1,320 |
| 25 | 1,056 |
| 36 | 880 |
| 49 | 754 |

Step 2--Plot Trap Locations:

Plotting the traps on planned grids allows for a concise description of the infested area. Do not place traps randomly in the field. If you don't have a grid, you can plot trap locations using a ruler or calipers. Following the square mile blocks on most county maps is also a good system.

Step 3--Number the Traps:

Once you have plotted trap locations on the map, consecutively number the traps within each county. Mark the trap number on the map and on the bottom of the traps with a permanent marker or grease pencil.

If you add traps to positive trap sites, identify the additional traps as part of a delimiting grid. Assign new numbers to the grid with a prefix. For example, Lando Grid 1 . . . 52.

The second number scheme is needed when the delimiting grid overlaps the original trap site.

Set Traps and Mark
Actual Positions

Step 1--Determine When to Set Traps:

Set traps immediately after plotting the trap sites.

HINT: A delimiting survey deployed early in the male flight period is more effective than a survey deployed near the end of adult flight. As the season progresses, fewer males are available for capture. Even though the male flight period may last for 4 weeks, an individual male lives a maximum of 3 days under normal conditions.

Step 2--Determine Where to Set Traps:

Select where the traps will be set at or about the plotted sites already marked on a map. Find a position as close as possible to the plotted site.

Many factors determine where to set a trap in a given survey area. The distance between traps depends on the required trap density and the local conditions. Place the traps in as uniform array as possible. Consider the general rules for setting traps listed in Appendix 3.

Step 3--Complete a Trap Record Sheet:

Complete a trap record sheet describing the actual trap site and its specific position. Trap record sheets will be provided locally.

Also, make corrections to the survey field map if the trap site was adjusted in the field.

Step 4--Mark Actual Trap Positions:

Only when necessary, mark the actual positions to expedite tending the trap. In urban areas where streets are named and houses are numbered, use the house address for identifying traps. Do not mark trap locations with ribbons or marking crayons in urban areas. Also, use restraint in marking roadside rest areas, picnic areas, tourist attractions, and other high use areas where the ribbon will detract from its appearance.

When it is necessary to mark a trap position, use plastic flagging ribbon or marking crayon. Brightly colored plastic tape (fluorescent orange) is the best flagging ribbon. The marking crayon must be sufficiently soft to mark wet trees.

Tie a piece of flagging ribbon to a telephone pole, tree trunk, or other suitable object at the roadside. The ribbon should be visible from the road when approaching from either side. Place a small piece of flagging ribbon near the trap.

Service the Traps

Step 1--Determine When to Service Traps:

Service the traps on a regular schedule of a maximum of 10 to 14 days.

More frequent servicing will allow for rapid replacement of missing or damaged traps, and information about the flight period of adult moths. Information gathered during the delimiting survey is useful in planning future projects for delimiting or eradication.

Step 2--Plan for Servicing Traps:

Plan your route before leaving the office to eliminate overlapping travel.

Gather all the supplies you will need such as, replacement traps, trap record sheets, staple gun and staples, and permanent markers.

Step 3--Service the Traps:

Look at the overall condition of the trap and look for suspect moths in the trap.

Refer to Appendix 3 for information on how to open and check traps.

Replace badly damaged or missing traps. Number the replacement trap with the same number as the original trap plus an indicator that represents it as a replacement. For example, 416-R where "R" represents replacement. Also, mark the date on the new trap.

Carefully remove and replace traps which contain suspect moths. Use the same numbering scheme described above. Record the date, time, and exact location of recovery on the local trap record sheet. Mark on the trap the date the trap was set and the date the trap was serviced. Immediately notify your supervisor.

Step 4--Record and Report Results of Service:

Write the following information on the trap record sheet: Trap site including descriptive information needed to help locate traps, trap numbers, county, trapper's initials, date set, and dates serviced.

Immediately report suspected AGM to your Regional Survey Coordinator. Include the time of recovery and the general survey area.

Submit AGM Suspects

Step 1--Record the Results of the Recovery:

Trap--Record on the bottom of the trap the date, time, results, and any pertinent observation or action taken. Also, record the last date the trap was serviced so that the trapping period is known.

Trap Record Sheet--Record the date and all circumstances about the recovery of suspect moths on the trap record sheet.

Gypsy Moth Identification Work Sheet (GMIWS)--Complete a GMIWS which will accompany the suspect AGM. Refer to Appendix 4 for instructions on how to complete the work sheet.

Step 2--Package the Traps:

Delta Traps--Place the entire, assembled trap in a sturdy, cardboard box. Pack around the trap with crumpled paper. Do not use loose packing material that would become entangled on the sticky surface of the trap.

Milk Carton or Black Light Traps--All specimens recovered from a single trap at one service should be packaged together. The specimens can be separately placed in glassine or paper envelopes, or can be placed together in a small paper bag. If there is a large number of specimens recovered from a single trap, multiple bags or envelopes can be used. Do not use plastic bags because the specimens will rot.

Label the envelopes or paper bags with the date of servicing, the date of the last previous servicing, the trap number, and its location.

Place the bags or envelopes in a sturdy, cardboard box. Carefully pack them in the box so the specimens will not break during mailing.

NOTE: The Otis Methods Development Center will supply small paper bags and cardboard boxes for submitting specimens to survey areas located within areas considered to be generally infested with the European strain of the gypsy moth.

Step 3--Mail Traps and Work Sheets:

1. Place the original (Otis Diagnostic Laboratory) and part 2 (Return to Submitter) of the GMIWS in the box with the specimen(s).

2. Mail the trap(s) or specimen(s), and two parts of the work sheet to the following address, using first class mail service.

Otis Diagnostic Laboratory
USDA, APHIS, PPQ
Otis Methods Development Center
Building 1398
Otis ANGB, MA 02542-5008

3. Send part 3 (Intermediate Identifier) of the work sheet to an intermediate identifier or to a coordinator or supervisor.

4. Retain part 4 (Submitter).

Remove Traps

At the end of the survey period, remove all set traps. Look for missing traps, and examine those found for AGM.

Step 1--Remove Traps From Sites:

Look for the trap number. Rewrite the number if it has faded. This will help you identify the traps later, if necessary. Record on the local trap record sheet the date the trap was removed.

Place the traps in a bag. Along with the trap, remove all the materials used to set and mark it (string, staples, wire, and flagging tape).

Step 2--Check the Traps for Suspect Moths:

Make a final check for suspect moths in all the collected traps. If you find suspect moths, follow the steps for submitting AGM suspects.

Step 3--Dispose of Traps:

Flatten empty, used traps. Dispose of them by burning the traps in an incinerator or by burying them at a sanitary landfill.

Report Survey
Results

The survey results will be reported into NAPIS. All State Survey Coordinators and some OIC's have the capability to enter data into NAPIS. Data should be entered using the formats in Appendix 5. It is a joint responsibility of the Survey Manager, the OIC with responsibility for Cooperative Agricultural Pest Survey (CAPS), and the State Survey Coordinator to insure that all data are properly assembled and presented for entry to NAPIS. In addition to the data specified below and in Appendix 5, other data useful to local or Regional staff may be entered into NAPIS at the discretion of program participants.

Positive survey results (AGM is found) will be reported immediately by Otis Methods Center to:

1. The site submitting the sample
2. The appropriate Regional Office
3. The Domestic and Emergency Operations Staff

A record for every positive find will be entered into NAPIS within 24 hours of notification.

Negative survey results will be summarized and reported annually into NAPIS. Do not report negative summary data until all data are collected and summarized by county. Refer to Appendix 5 for instructions on reporting survey data into NAPIS.

Complete Survey
Maps

During the survey period, record all positive trap recoveries on the survey field map. Show both negative and positive trap recoveries. These maps are used for postseason review and decision making when determining the patterns of trap recoveries and establishing treatment boundaries.

SURVEY
Indirect Survey

Introduction

Purpose:

To determine where isolated infestations of AGM occur by surveying the traps placed for the domestic gypsy moth program and other survey programs such as the European corn borer survey.

Time of Survey:

In conjunction with other domestic survey programs.

Overview:

Indirect surveying will occur as individuals are made aware of possible AGM finds in their work on other survey programs.

The Domestic Gypsy
Moth Program

If AGM suspect specimens are found in traps within 15 miles of AGM survey sites, send the specimens to the Otis Methods Center following the instructions detailed on page 29 under Detection Survey.

If AGM suspect specimens are found in traps placed beyond 15 miles of an AGM survey site, freeze the specimens and keep them at your work station office or at your Area Identifier's office for 6 months.

Other Domestic
Survey Programs

If AGM suspect specimens are found, send them to the Otis Methods Center following the instructions detailed on page 29 under Detection Survey.

REGULATORY
Introduction

| | |
|--------------------|---|
| Overview | <p>The Regulatory section of this manual explains procedures for excluding and inspecting ships which are Asian gypsy moth (AGM) suspect.</p> <p>These procedures have been discussed with State cooperators, shipping associations, commodity groups, and other stakeholders. In addition, International Services and the Forest Service (FS) are working with Russia's plant protection officials to develop and implement procedures that will eliminate AGM contamination at Asian ports.</p> |
| Purpose | <p>To prevent the artificial spread of AGM from high risk areas--Far East Russian ports where the ship was during July, August, or September of the previous year. Requiring exclusion or inspection of contaminated ships will prevent the artificial spread of AGM.</p> |
| Public Information | <p>A part of PPQ's job in regulatory enforcement is to inform the public of the potential of AGM infestation. Provide the public with information on the AGM through pamphlets, the media, and maintain contact with businesses that use the targeted ships.</p> |
| Safety | <p>Safety guidelines for boarding vessels will not be repeated here. Most of the guidelines are in the Airport and Maritime Operations Manual, Maritime Operations, Prerequisites to Clearing Vessels.</p> |
| Materials Needed | <p>When inspecting ships, be sure to have the equipment readily available. Most of the equipment is listed in the overview for Clearing Vessels in the Airport and Maritime Operations Manual.</p> |

In addition, the following materials may be needed for a required inspection and/or treatment:

- Small, hand sprayers
- Supply of a product (Golden Natur'l Spray Oil●, soybean oil, pine scent, liquid floor wax, or detergent (all purpose cleaner))
- Binoculars (approximately 7x or 8x)
- Amber safety glasses

REGULATORY
Inspection Procedures

Determine Status
of Arriving
Ships

Determine which arriving ships are excluded (high risk), which can be boarded on arrival (low risk), and which require normal, non-AGM boarding procedures. Listed here is a narrative description of the main steps involved in determining your action. Also, on page 49 is a table which summarizes your action.

Step 1--Check the Alert List:

Check the ship's name and Lloyd's ship number against those on the alert list and subsequent updates. The alert list is not all inclusive, so take special care to assure bulk carriers do not meet alert list criteria (Step 3).

The alert list of AGM suspect ships will be entered in the U.S. Coast Guard's (CG) lookout data base (MSIS). The CG will notify the local PPQ office when an AGM suspect ship reports in to a port.

NOTE: Ships may change their name.

Step 2--Check the Ship's Itinerary:

Check the ship's itinerary for a Far East Russian port that occurs within the range from Posyet to Nikolayevsk. The three most likely ports are: Nakhodka, Vladivostok, and Vostochnyy. Refer to Appendix 6 for a non-inclusive list of ports from the high risk area. Northern Chinese ports, Japanese ports, and Korean ports may also be suspect.

HINT: If strange names are on the itinerary, get a map out of the high risk area (extreme Southeast mainland of Russia), and match any listed ports.

Verify when the vessel called at the Far East Russian port. Did it call at the port during July, August, or September?

| If the month is: | And the ship's name is: | And the ship's itinerary: | And the ship called at the Russian port(s) during: | Then: |
|---|-------------------------|--|--|---|
| March April May June July (high risk hatching period) | On the alert list | | | <ul style="list-style-type: none"> ● EXCLUDE entry ● PROVIDE options for inspection outside the port area |
| | | | | |
| | Not on the alert list | Includes a Far East Russian port | July August September | <ul style="list-style-type: none"> ● ALLOW movement to berth ● BOARD on arrival |
| | | | Other than the months listed above | |
| January February August September October November December (low risk hatching period) | On the alert list | Does not include a Far East Russian port | | REQUIRE normal, non-AGM boarding procedures |
| | | Cannot be ascertained | | <ul style="list-style-type: none"> ● ALLOW movement to berth ● BOARD on arrival |
| | Not on the alert list | Includes a Far East Russian port | July August September | <ul style="list-style-type: none"> ● BOARD on arrival |
| | | | Other than the months listed above | |
| | | Does not include a Far East Russian port | | REQUIRE normal, non-AGM boarding procedures |

Step 3--Apply Criteria:

High Risk Ships--Determine which arriving ships are high risk and are excluded entry. These ships can be boarded in stream or at other preselected remote sites.

Consider a ship high risk which is arriving at a continental U.S. port during March, April, May, June, and July, AND

- Which is specifically identified on the AGM alert list.
- With an itinerary including a Far East Russian port where the ship was during July, August, or September of the previous year.
- With a Russian flag and an itinerary that cannot be adequately determined where the ship was during July, August, or September of the previous year.

Low Risk Ships--Determine which arriving ships are low risk and are allowed to proceed to the intended berth for initial AGM inspection and follow-up monitoring, if necessary.

Consider a ship low risk which is arriving at a continental U.S. port during January, February, August, September, October, November, and December, AND

- Which is specifically identified on the AGM alert list.
- With an itinerary including a Far East Russian port where the ship was during July, August, or September of the previous year.
- With a Russian flag and an itinerary that cannot be adequately determined where the ship was during July, August, or September of the previous year.

EXEMPTION: Hawaii, Puerto Rico, and Guam are exempt from excluding entry to ships because the climate and host conditions are not suitable for AGM. Therefore, throughout the year ships from Far East Russian ports are allowed to arrive subject to inspection in Hawaii, Puerto Rico, and Guam.

NOTE: Southern ports need to be more aware of AGM inspection of ships year round because of the possible risk of larvae hatching in these warmer climates, even during the months which we are not considering the high risk hatching period.

**Exclude Entry
to High Risk Ships**

Exclude entry to ships arriving at a continental U.S. port during the high risk hatching period which are specifically identified on the alert list or those with an itinerary including a Far East Russian port where the ship was during July, August, or September of the previous year. Every effort should be made to encourage a voluntary exclusion of these ships by the shipping industry.

During the high risk hatching period, inspection can be accomplished by boarding in stream or at preselected sites. Provide options to inspect or conduct an initial evaluation at a remote location. Boarding a ship in stream is an option which must be requested by the ship's agent and approved by Regional Directors.

If the ship is found to be free of suspect AGM egg masses or larvae, allow the ship to proceed to its intended berth. While in port, monitor the ship daily for hatching AGM larvae.

Board In Stream:

Boarding ships in stream is a nonstandard procedure. If your Regional Director approves boarding in stream of specific ships, then follow these guidelines.

1. Request the ship's agent or the CG (at particular sites) arrange for and provide boarding and retrieval launch.

Following local operations, request the CG to transport PPQ Officers to the high risk ship, and provide a suitable platform to board the ship.

NOTE: CG units at ports where they are without sufficient resources to transport PPQ Officers will provide PPQ with a list of certified, commercial marine taxi or launch service.

2. Wear a CG approved flotation jacket.
3. Board the ship on arrival, within 1 hour after sunrise and 3 hours before sunset.
4. Board by conventional gangway or another method judged safe by the boarding officers. **Never use a Jacob's ladder for boarding.**
5. Only volunteers will board ships instream. Boarding parties should consist of at least two PPQ Officers.

Order a Ship to Leave:

Take the following actions when ordering a ship to leave U.S. waters. These actions follow the guidelines provided in the Airport and Maritime Operations Manual for Clearing Vessels.

1. Issue an Emergency Action Notification, PPQ Form 523. (Instructions for completing a PPQ Form 523 are in Appendix 1 of the Airport and Maritime Operations Manual.) Request the ship's master to prepare for and execute an immediate departure. The notification will instruct the ship's agent to immediately call out necessary tugs, linemen, and pilots for the ship's departure. The only actions allowed are those that make the ship seaworthy, such as bunkering.
2. Issue a Request for Customs Action, PPQ Form 227. Request a stop to all business related to the ship, other than as necessary to make the ship seaworthy. Customs will withhold clearance, either coastwise or foreign.

3. Send or hand deliver a cover memorandum with a copy of the Emergency Action Notification to the CG Port Captain. Request the Port Captain's help to immediately escort the ship from U.S. waters.

Board Low Risk Ships During the low risk hatching period, suspect AGM ships are boarded on arrival. Inspect all accessible areas of the ship's superstructure. Inspect the ship's hold(s) when there is indication (physical evidence on the superstructure or ship records) that the ship has been cleaned for AGM. A minimum of two officers should conduct the inspection.

Suggestion: Look for AGM egg masses when boarding any ship from Asian ports.

Step 1--Look for Egg Masses:

Egg masses are the most likely life stage to be found on the superstructure of ships. During certain periods of the year (March through July), hatching larvae can be found. Hatching larvae present an unacceptable pest risk any time of the year at any U.S. port.

Use USDA/APHIS Program Aid Number 1329, Don't Move Gypsy Moth for identifying life stages of gypsy moths.

HINT: Egg masses are normally deposited in sheltered spots such as, in crevices, in cavities, under tarps, and behind walls and doors.

HINT: The female AGM is attracted to light. Therefore, the female moths could lay their egg masses on surfaces of the ship that are exposed to night lights. However, if the ship was lit with shore based flood lights while in a Far Eastern port, egg masses could be found in all locations.

HINT: Look for evidence of fresh paint covering scrapes on walls or painted over egg masses.

HINT: Look for hatching larvae that may be ballooning (being blown by the wind on silk strands) from the ship. Peak hatching of eggs is in the morning. Dispersing larvae move toward vertical structures and climb rapidly.

Use the following table to determine your action when inspecting suspect AGM ships or ships with Far East Russian ports of call.

| If the month is: | And you find: | Then: |
|---|-------------------------------|--|
| March April May June July (high risk hatching period) | Egg masses or hatching larvae | ORDER the ship to leave--refer to the guidelines under Exclude Entry to High Risk Ships |
| | No life stages of AGM | <ul style="list-style-type: none"> ● ALLOW the ship to dock and conduct business ● REQUIRE daily monitoring for life stages of AGM until the ship leaves the U.S. port |
| January February August September October November December (low risk hatching period) | Egg masses or hatching larvae | DETERMINE final regulatory action based on level of infestation and guidance from management |
| | No life stages of AGM | <ul style="list-style-type: none"> ● ALLOW the ship to dock and conduct business ● MONITOR the ship while in port |

Step 2--Require Treatment:

When necessary, require drenching the egg masses with one of the following products:

1. Golden Natur'l Spray Oil● (to be registered; may not be available)
2. Soybean oil diluted with 50 percent isopropyl alcohol (acceptable; not registered)
3. Pine scent, 100 percent solution (marginally acceptable; not registered)
4. Liquid floor wax, 100 percent solution (marginally acceptable; not registered)
5. Detergent (all purpose cleaner), 100 percent solution (marginally acceptable; not registered)

Application Techniques--Using a small, hand sprayer, apply the mixture to individual egg masses until they are completely saturated. Keep the mixture agitated while treating.

Establish contingency plans to use commercial spray equipment for large, fast applications. OIC's should work with port authorities and/or a ship's agent to arrange for commercial pesticide applicators to be on standby in the event they are needed to apply the treatment. Commercial application will be at the expense of the agent, vessel, and/or port authority.

If a sample of egg masses is needed for confirmation or identification, then remove a few egg masses from the ship. Using a wire brush or paint scraper, scrape a few egg masses from the ship's surface. Be careful not to drop egg masses into the water.

Step 3--Monitor Ships:

Daily monitor ships that have been allowed to dock until they leave the port.

Peak hatching of eggs is in the morning. Dispersing larvae move toward vertical structures and climb rapidly.

If double-sided sticky tape is placed around most of a ship's vertical structures, then check the bands daily for larvae which cannot get past the tape.

Step 4--Report Inspection Results:

Each PPQ Regional Office will relay to Port Operations within 1 working day via telephone, telemail, or FAX the following information regarding AGM ship inspections:

- Vessel Name
- Flag
- Port
- Date of Inspection
- Result of Inspection--positive (life stage found) or negative
- Action--brief statement

Clearly identify documented information with the title: AGM ship inspection.

PPQ Form 288 (Ship Inspection Report) can be used to document the above information. Note in remarks the results of inspection and the action taken.

Agriculture Canada (Ottawa operations) will notify Port Operations of their AGM vessel inspection results. Port Operations will in turn notify Agriculture Canada of the U.S. AGM vessel inspection results. This information will be used by both countries to update the alert list of suspect AGM vessels.

1. The purpose of this document is to provide information on the Asian Gypsy Moth (AGM) and its impact on the environment. This document is intended for use by regulatory agencies and other interested parties. The information provided is for informational purposes only and should not be used for regulatory purposes. The information is based on the best available data and is subject to change as more information becomes available. The information is provided for informational purposes only and should not be used for regulatory purposes. The information is based on the best available data and is subject to change as more information becomes available.

CONTROL

Introduction

Overview

The Control section of this manual summarizes the eradication procedures which will be conducted in Oregon and Washington during 1992.

The results of the detection and delimiting surveys will determine if additional eradication procedures will need to be established and presented in this manual.

This section does not cover planning a control project, eradication procedures, information in the aerial application manual, or the duties and responsibilities of a Contracting Officer's Representative. If you are responsible for some aspect of this control project and you need additional information, contact your local representative with APHIS, Forest Service (FS), or the State Departments of Oregon or Washington.

Purpose

To eradicate isolated infestations of AGM.

Background

A cooperative eradication project was established by APHIS, FS, and the State Departments of Oregon and Washington. The AGM project was organized to take advantage of the infrastructures and existing linkages of the cooperating agencies. APHIS and FS will cost-share the project with the States. Specialized services, public information, and technical support have been positioned to actively support the project.

The project is implemented through Cooperative Agreements between APHIS and FS and the States of Oregon and Washington. These agreements will describe each Agency's activities and the cost-share funding arrangements. These agreements will provide specific guidelines to the Cooperator regarding fiscal reporting requirements.

The technical support for the project is provided through a panel of recognized gypsy moth experts. These scientists represent Federal agencies, State agencies, and the academic community. The AGM Science Panel is responsible for analyzing the project's biological and technical information and for providing recommendations to the Project Management Team.

Compliance

All eradication efforts are conducted in compliance with the National Environmental Policy Act (NEPA). If eradication activities are extended to other sites, then a site-specific environmental assessment will be prepared by Biotechnology, Biological, and Environmental Protection.

All eradication efforts are carried out under the Gypsy Moth Suppression and Eradication Projects Final Environmental Impact Statement as supplemental--1985 (FEIS). The FEIS contains requirements that must be followed in conducting an eradication program.

Safety Precautions

Personal safety must be a prime consideration in all eradication efforts. Stress safety practices in preprogram planning. Supervisors must enforce on-the-job safety procedures. The following pesticide safety references must be available to all personnel handling pesticides:

- M390.1402 PPQ Guidelines for Managing and Monitoring Pesticide Spills (Revised Jan. 1983)
- APHIS Directive 450.5 dated 7/8/82: APHIS Cholinesterase Testing Program
- Pesticide Label and Labeling Safety Instructions/Precautions
- Pesticide First Aid Handbook
- Recognition and Management of Pesticide Poisoning: Donald P. Morgan, Environmental Protection Agency, 1982
- Hazardous Materials: 1980 Emergency Response Guidebook: DOT-P-5800.2: Department of Transportation
- The New Pesticide Users Guide, Bert L. Bohmont, Prentice-Hall Inc. (The reference used in PPQ's Self-Instructional Pesticide Applicator Certification Training)

Before beginning a spray program, get the necessary safety and cleanup materials. Materials should include the following:

- Safety materials:
 - One each, first aid kit--bus and truck kit (GSA # 6545-00-664-5312) or equivalent
 - One each, fire extinguisher--5 pound size for class A, B, and C fires
 - Two each, portable eye wash kit
- Cleanup materials:
 - One each, shovel, square-point, "D" handle (GSA # 5120-00-224-9326 or equivalent)
 - Twenty-five each, large, heavy-duty plastic bags with ties (GSA # 8105-00-848-9631 or equivalent)
 - Two pairs of unlined vinyl rubber boots
 - Four pairs of disposable coveralls
 - One each, 5-gallon water container (GSA # 8115-00-145-0038 or equivalent)
 - Four pairs of unlined vinyl rubber gloves
 - Two approved respirators with approved pesticide canisters (self-contained breathing apparatus must also be available in operations where methyl bromide is used)
 - One each, broom (GSA # 7920-00-292-4375 or equivalent)
 - One each, dust pan (GSA # 7290-00-616-0109 or equivalent)
 - One pint bottle of liquid detergent
 - Two each, scrub brushes, (GSA # 7920-00-068-7903 or equivalent)
 - One each, plastic cover or tarpaulin (to cover dry spills) (GSA # 8135-00-529-6487 or equivalent)
 - Twenty-five pound bag of absorbent material (GSA # 7930-00-269-1272) (sweeping compound, sawdust, kitty litter, or other absorbent materials)
 - One each, large metal or heavy duty plastic garbage can with removable cover for storing contaminated materials for later disposal (NOTE: This may also be used to store the cleanup materials in rear of pickup truck during transport.) When subcompact vehicles are involved, supervisors will use their judgement in selecting materials to be used.

Asian Gypsy Moth

Control

CONTROL
Methods and Procedures

Introduction

Here is a summary of the activities being conducted in 1992 for the AGM eradication project. If the eradication project is extended beyond areas in Oregon and Washington where the activities are being conducted under cooperative agreements, this manual section will expand to include guidelines for planning a control project and procedures for eradicating, using insecticides and/or egg mass trapping.

Aerial Application

Two treatment blocks will be treated within Tacoma, WA, and Portland, OR areas. The blocks encompass 10 positive AGM sites, including a 2 mile wide buffer around the fringe of the area. *Bacillus thuringiensis* (Bt) insecticide, neat (undiluted), will be applied by helicopter at a rate of 24 BIU's per acre. Three applications are planned.

Post Treatment
Survey

Pheromone baited Delta traps will be set at a density of 16 per square mile within the treatment area. Traps will be checked one or more times during the season to detect surviving or newly established populations. Refer to Appendix 3 for instructions on how to assemble and service Delta traps.

Burlap band larval traps (50) will be placed at each 1991 positive trap site to evaluate Bt effectiveness and intensively monitor these sites.

Delimiting Survey

Level One:

A 20 mile wide band around the Bt treatment blocks will be trapped at a rate of 16 traps per square mile. These traps will be checked at 2-3 week intervals and mass trapped if any positive catches are found.

Level Two:

An area encompassing a 20 mile radius around high hazard inland waterways will be trapped at a density of 16 traps per square mile. These traps will be set and retrieved only.

Detection Survey

An area encompassing a 20 mile radius around the two high-hazard, west coast ports of Coos Bay, OR, and Gray's Harbor, WA, will be trapped at a density of 16 traps per square mile. These traps will be set and retrieved only. Detection survey at these two ports will be fully funded by APHIS, covered under a separate cooperative agreement.

APPENDIX 1

Definitions, Abbreviations, and Terms

Alert list--A list of ships which has a Far East Russian port in their itinerary during the critical period of July, August, or September. The list is electronically sent to each PPQ Region. The information on the list is the most complete and reliable that is available, but it may not be all inclusive. Port Operations will electronically send updates to the list as additional information is received. The results of our inspections at other ports and Canada will be the basis for updates.

Asian gypsy moth (AGM)--*Lymantria dispar*, Linnaeus, (Lepidoptera: Lymantriidae). A moth native to Asia, having hairy larvae that feed on foliage and are very destructive to hardwood trees. The AGM is similar to the European gypsy moth that is found in the Northeastern United States and Southeastern Canada. The behavior characteristics that distinguish the Asian strain from the European is that the adult female moths are active fliers and can fly to distances up to 25 miles. Also, the AGM has a broader host range, including larch, oak, poplar, alder, willow, and some evergreens.

***Bacillus thuringiensis* (Bt)**--The scientific name of the bacterium that is pathogenic to the larval stage of many lepidopterous insects. The active ingredient in biological insecticides sold under the trade names--Dipel, Foray, and Thuricide.

Black light trap--Works by attracting insects that fly and are active at night to a black light source and then capturing the insects in a collecting container. The black light traps were selected for detecting AGM in areas considered to be generally infested with gypsy moths because both male and female moths fly, and the female is attracted to light.

Bt--The abbreviation used for the biological insecticide *Bacillus thuringiensis*.

Bunkering--Filling a ship's storage area for fuel with coal or oil.

Delimiting survey--Using pheromone and black light traps to determine if an infestation is present and if present, the approximate size of the infestation.

Delta trap--A triangular shaped trap made of plastic coated cardboard which uses disparlure to attract male gypsy moths.

Detection survey--Using pheromone and black light traps to determine where isolated infestation of gypsy moths occurs and where further delimiting may be necessary.

Disparlure--Commercially synthesized female gypsy moth sex pheromone.

Eradication project--Action taken to eliminate isolated gypsy moth infestations.

Far East Russian ports--Range of maritime ports on the far east side of the Commonwealth of Independent States (formerly U.S.S.R.) from Posyet to Nikolayevsk. Three ports from this area have been on itineraries of ships which were found infested with AGM in Canada. Canada has established that vessels arriving from Vladivostok, Nakhodka, and Vostochnyy are high risk. Refer to Appendix 6 for a list of ports from the high risk area.

FS--The abbreviation used for the Forest Service.

High risk areas--Far East Russian port where the ship was during July, August, or September of the previous year.

High risk period--March, April, May, June, and July.

Inter-trap spacing--Distance between traps described in feet.

Isolated infestation--An area that is infested with AGM, determined as a result of a positive detection survey.

Low risk area--That portion of the survey area not designated as a high-risk area.

***Lymantria dispar* (L.)**--The scientific name for Asian gypsy moth.

Milk carton trap--A milk carton shaped trap made of plastic coated cardboard which uses disparlure to attract male gypsy moths. The difference between a delta trap and a milk carton trap is the capacity. Milk carton traps are placed where you can expect to trap 20 or more moths.

NAPIS--The abbreviation used for the National Agricultural Pest Identification System.

Natural spread--Movement of gypsy moth from infested areas through the flight of adult female gypsy moths and windblown larvae.

Posttreatment survey--A delimiting survey conducted after an eradication program to determine if eradication was successful.

Trapping frequency--How often an area is trapped.

APPENDIX 2

List of Survey Areas

Introduction

Use this appendix to identify the designated areas for detection survey in 1992. The general information provided for the listed survey areas is their level of risk, area to survey, number of traps required, and the survey period.

Note that survey activities conducted in Oregon and Washington are not covered in this manual.

The survey areas are locations where Asian gypsy moth (AGM) infestations may have been introduced by AGM contaminated ships entering ports and waterways. The survey areas are presented by State which are divided by the following geographical characteristics:

- U.S. ports and land areas along waterways located **outside** of the area generally infested with the European strain of the gypsy moth.
- U.S. ports and land areas along waterways located **within** the areas considered to be generally infested with the European strain of the gypsy moth.

Survey Areas

Survey Areas Located Outside Areas Generally Infested
With the European Strain of Gypsy Moth:

| PORT | RISK | AREA TO SURVEY MILES ² | # PHEROM. TRAPS | SURVEY PERIOD |
|---------------|------|---|--------------------|------------------|
| Alabama | | | | |
| Mobile | Low | 72 | 304 | May-Sep |
| California | | | | |
| Eureka | High | | 720 | Jul-Sep |
| Long Beach | High | | 1,720 | May-Sep |
| Oakland/ | | | | |
| San Fran. | High | | 890 | Jul-Sep |
| Port Hueneme | High | | 1,500 | May-Sep |
| Sacramento | High | | 1,089 | Jul-Sep |
| Sacramento | | | | |
| River (from | | | | |
| Oakland to | | | | |
| Sacramento, | | | | |
| San Joaquin | | | | |
| River from | | | | |
| Oakland to | | | | |
| Stockton) | High | | 400 | Jul-Sep |
| San Diego | High | | 1,570 | May-Sep |
| Stockton | High | | 1,485 | Jul-Sep |
| Florida | | | | |
| Fort Pierce | Low | 5 | 24 | May-Sep |
| Tampa | Low | 131 | 400 | May-Sep |
| Louisiana | | | | |
| Baton Rouge & | | | | |
| Mississippi | | | | |
| River | High | | 552 | May-Sep |
| Lake Charles | Low | | 92 | May-Sep |
| New Orleans | High | 244 | 700 | May-Sep |
| Mississippi | | | | |
| Gulfport | Low | 65 | 284 | May-Sep |
| Pascagoula | Low | 46 | 200 | May-Sep |

| PORT | RISK | AREA TO SURVEY MILES ² | # PHEROM. TRAPS | SURVEY PERIOD |
|---|------|---|--------------------|------------------|
| Oregon (special surveys) | | | | |
| Astoria | High | | 6,000 | Jul-Sep |
| Columbia River (from Astoria to Portland) | High | | 7,500 | Jul-Sep |
| Kalama, WA | High | | 6,000 | Jul-Sep |
| Longview, WA | High | | 6,000 | Jul-Sep |
| Newport | High | | 6,000 | Jul-Sep |
| Portland | High | | 10,000 | Jul-Sep |
| Oregon (other surveys) | | | | |
| Coo's Bay | High | | 6,000 | Jul-Sep |
| Texas | | | | |
| Brownsville | Low | 5 | 104 | May-Sep |
| Corpus Christi | Low | 45 | 100 | May-Sep |
| Houston | High | 300 | 1,500 | May-Sep |
| Galveston | High | 17 | 120 | May-Sep |
| Port Arthur/ Beaumont | High | 250 | 1,200 | May-Sep |
| Victoria (Pt Comfort) | Low | 28 | 116 | May-Sep |

| PORT | RISK | AREA TO SURVEY MILES ² | # PHEROM. TRAPS | SURVEY PERIOD |
|---|------|---|--------------------|------------------|
| Washington (special surveys) | | | | |
| Anacortes | High | | 6,000 | Jul-Sep |
| Bay City | High | | 6,000 | Jul-Sep |
| Bellingham | High | | 6,000 | Jul-Sep |
| Columbia River (from Astoria, OR, to Vancouver; Straits of Juan de Fuca; Puget Sound, and San Juan Islands) | High | | 51,600 | Jul-Sep |
| Everett | High | | 6,000 | Jul-Sep |
| Kalama | High | | 6,000 | Jul-Sep |
| Longview | High | | 6,000 | Jul-Sep |
| Olympia | High | | 6,000 | Jul-Sep |
| Port Angeles | High | | 6,000 | Jul-Sep |
| Port Townsend | High | | 6,000 | Jul-Sep |
| Seattle | High | | 10,000 | Jul-Sep |
| Tacoma | High | | 38,000 | Jul-Sep |
| Vancouver | High | | 6,000 | Jul-Sep |
| Washington (other surveys) | | | | |
| Gray's Harbor | High | | 6,000 | Jul-Sep |

Survey Areas Located Within Areas Considered to be Generally Infested With the European Strain of the Gypsy Moth:

| PORT | RISK | AREA TO | # TRAPS | | SURVEY PERIOD |
|--|------|---------------------------|---------|------|---------------|
| | | SURVEY MILES ² | BLT | PHER | |
| Atlantic Coast Ports | | | | | |
| Newark | Low | | 10 | 0 | Jul-Sep |
| New Haven* | High | 65 | 10 | 12 | Jul-Sep |
| Hampton Rds/ Norfolk | Low | 32 | 20 | 0 | Jul-Sep |
| Massena, NY (St. Lawrence Seaway, at Locks) | | | 10 | | Jul-Sep |
| Philadelphia | Low | 80 | 10 | 0 | Jul-Sep |
| Wilmington | Low | 3 | 10 | 0 | Jul-Sep |
| Great Lakes Ports | | | | | |
| Burns Harbor | Low | 35 | 0 | 140 | Jul-Sep |
| Chicago | Low | 115 | 0 | 476 | Jul-Sep |
| Cleveland | High | 38 | 10 | 156 | Jul-Sep |
| Detroit | Low | 3 | 10 | 0 | Jul-Sep |
| Duluth | Low | 70 | 0 | 300 | Jul-Sep |
| Toledo | High | 76 | 10 | 308 | Jul-Sep |

*Because of the gypsy moth density, New Haven will use 12 milk carton traps. Traps will be exposed 1 day each week for 24 hours. Traps should be located within 1 mile of the dock area. Trap from July 1 to August 15.

APPENDIX 3

How to Assemble, Set, and Service Traps

Introduction

There are three kinds of traps used for detecting and delimiting AGM. They are the delta trap, the milk carton trap, and the black light trap.

Use this appendix to identify for each type of trap the materials you need to assemble the trap, instructions for assembly, general rules for setting the trap, and instructions for servicing the trap.

Delta and Milk Carton Traps:

These are pheromone traps that use disparlure to attract male gypsy moths. The difference between a delta trap and a milk carton trap is the capacity. Milk carton traps are placed where you can expect to trap 20 or more moth.

Males pupate earlier than females so the timing of setting the pheromone traps is critical. Male emergence will vary in an area by up to 10 days, depending on local weather conditions. The traps must be placed before male emergence.

Black Light Trap:

It works by attracting to a black light source, insects which fly and are active at night. Male and female AGM's can be trapped in black light traps because they both fly. Also, the female AGM is attracted to light. Once captured, the insects drop into a collection container equipped with a killing agent.

Delta Insect
TrapMaterials:

You'll need the following materials:

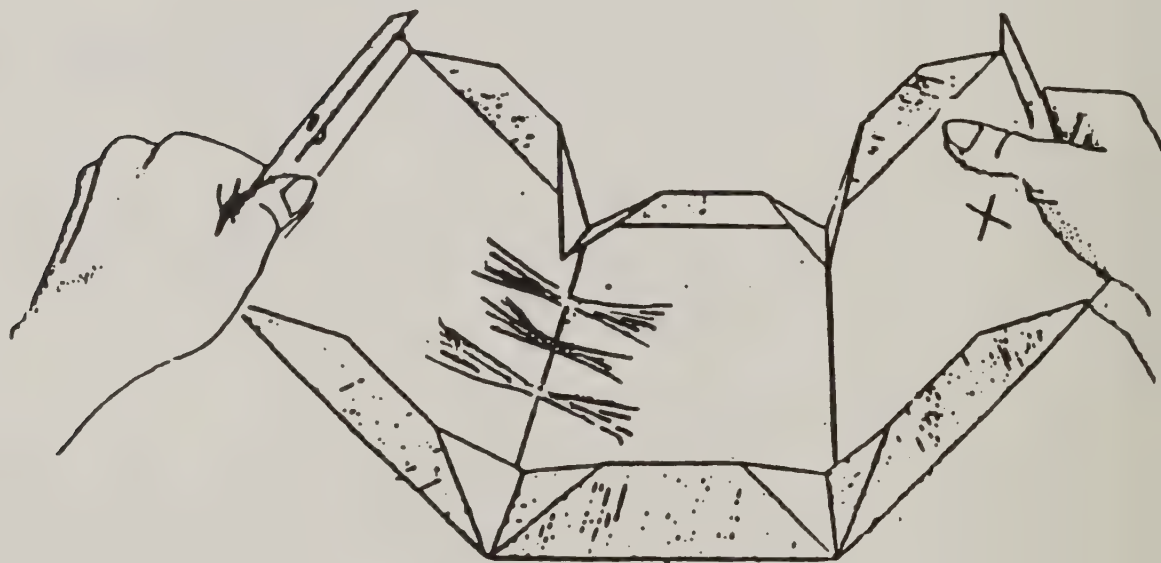
- Delta trap
- Disparlure dispenser
- Stapler
- Paper clips
- Staple gun and staples, wire, or string for hanging the trap
- Permanent markers or grease pencils

Assemble:

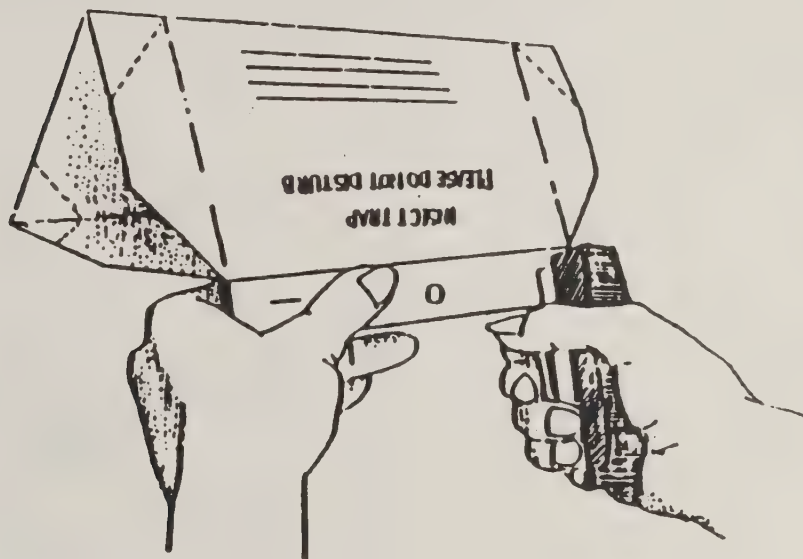
Use the following instructions for assembling the delta trap:

Step 1--Staple the lure to the "X" on the nonsticky side.

Step 2--Pull the trap open--pull sticky sides away from each other.



Step 3--Fold the trap into a triangle. Fold top flap over and staple or paper clip together.



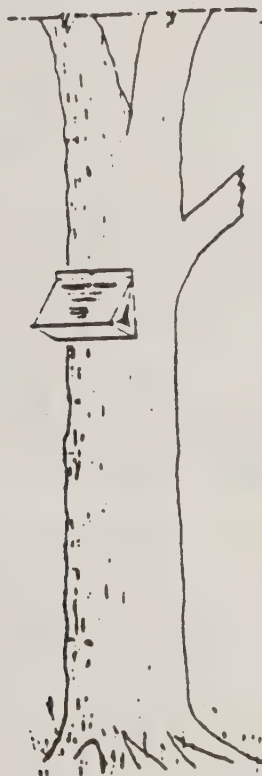
Step 4--Fold in corners at both ends.



Step 5--Fold in sides at both ends. NOTE: It is important that the ends are folded properly. If they are not, the size of the entry port is restricted and will result in restricted male captures.



Step 6--Hang or staple trap in place (4 to 5 feet off the ground--chest high).



Set:

Consider the following general rules for setting pheromone traps:

1. Try to place traps on or near preferred hosts. Some of the host trees are grouped according to AGM preference and are listed below.

NOTE: The potential host range of AGM in the United States is unknown. In the Far East, AGM has been recorded on nearly 600 hosts. Therefore, do not ignore sites because no listed hosts are present.

Hosts Preferred by All Larval Instars

| | | |
|----------|-----------------|------------------|
| Alder | Birch (except | Mountain ash |
| Apple | yellow & black) | Oaks (all types) |
| Aspen | Boxelder | Speckled alder |
| Basswood | Larch | Sweet gum |
| | Linden | Willow |

Hosts of Later Larval Stages

| | | |
|-----------|----------|--------|
| Beech | Chestnut | Pine |
| Blueberry | Hemlock | Spruce |

2. Male moths tend to follow woodland edges and lines of tree growth. Moths do not travel to open areas where there are no trees or shrubs. However, do not ignore small clumps of trees or fence lines with host material.

3. If available, woodland edges are the best positions in a trap site. Traps are most effective when placed at or near a woodland corner. If there is a choice, place the trap on the windward side so the prevailing wind currents will carry the scent (pheromone) into the woods.

4. If there are no woodlands or residential positions within a reasonable distance (500 to 1,000 feet) from the plotted site, then the best position for a trap is at the end of a hedge row or tree leading to a wooded area.

5. Increase the trap's efficiency by placing it on a tree trunk, pole, or other vertical structure. Hanging the trap from a tree limb some distance from the trunk will decrease its efficiency.

6. Avoid omitting traps. Trap positions can be moved up to one-third the inter-trap distance to adjust for local conditions.

7. Place traps 4 to 5 feet high (or eye level if less than 5 feet) on vertical structure because most gypsy moth flight occurs near this height. In areas frequented by small children or cattle, place the trap out of their sight and reach.

8. Do not set the trap where foliage or branches will block the trap openings.

9. Whenever possible, avoid setting traps on or in the following places:

- Close to gravel road (place trap at least 50 feet away)
- Properties that are for sale
- Parks or open areas where people can easily see the traps
- Properties with aggressive dogs
- Private property without the owner's permission
- School properties or along passageways where students walk
- Sites where farm animals may damage or destroy traps (hang the traps higher or outside of a pasture)
- Sites where road construction is scheduled or in progress
- Sites within locked gates
- Tree branches
- Trees having poison ivy vines
- Trees marked for cutting or removal

Service:

Check the delta traps by opening one triangular end. Look into the opening for male moths. If you suspect that a male moth is present, remove and replace the entire trap.

The steps for servicing traps for detection surveys begin on page 27, and for delimiting surveys the steps begin on page 37.

Milk Carton Trap

Materials:

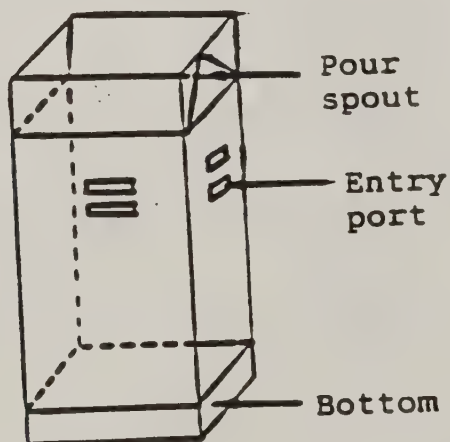
You'll need the following materials to assemble a milk carton trap:

- Trap body
- Trap hood
- Seven inch twist tie (available in most garden stores)
- Disparlure dispenser
- DDVP strip (insecticide also called Vapona strip)
- Stapling pliers
- Cotton twine (20 ply or stronger) or flexible wire for hanging trap
- Small binder clip

Assemble:

Use the following instructions for assembling the milk carton trap:

Step 1--Pop out the paper inserts from the eight entry ports of the trap body, if not already done, and crease body lines several times.

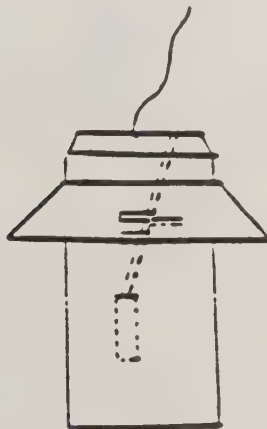


NOTE: Use the outer package or rubber gloves to handle the insecticide strip. Handle the insecticide strip as little as possible.

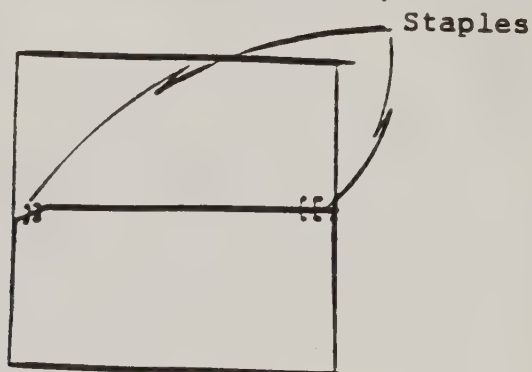


Step 5--Insert the twist tie into the trap body, leaving the top inch folded over the trap top. Place the insecticide and disparlure near the center of the trap. Place the top of the twist tie just behind where the pour spout will open. Staple the twist tie to the top side of the milk carton that is not the pour spout.

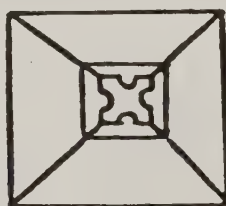
Staple a 24 inch length of cotton twine (20 ply or stronger) to the top, center inside the milk carton.



Step 2--Open, invert, then fit the bottom together. Fasten the bottom with stapling pliers, or affix a 10" piece of heavy duty tape along the bottom juncture.



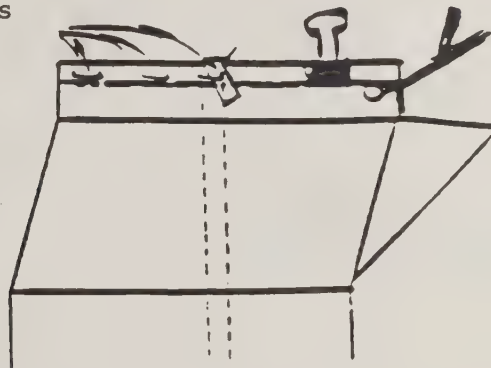
Step 3--Pop out the center insert of the trap hood, crease all tabs up, and crease all solid lines up. Slide the hood (shiny side up) down over the body of the trap until you go below the slits, which are above the entry ports. Slide the hood upwards so the semi-circular tabs on the hood slide into corresponding body slits. Staple all four tabs to the trap body to secure the hood.



Step 4--Staple the insecticide strip (DDVP strip also called Vapona strip) onto one end of a 7 inch strip of twist tie. Fold over (1") the other end. Staple the disparlure perpendicular to the twist tie and about 2 1/2 inches above the insecticide strip.

Step 6--Fold the top ends of the trap in toward the center of the trap so the two sides are parallel to one another. The end that has a crease in it is the pour spout--do not staple the top portion of the pour spout end. To close the trap, staple half of the top ridge up to the pour spout. Use a binder clip or twist tie to secure the pour spout closed. Leaving the pour spout unstapled will allow for frequent servicing.

Staples



Step 7--Hang the trap 4 to 5 feet above ground level, away from obstructive branches and foliage.



Set:

Consider the general rules for setting pheromone traps listed in this Appendix under delta traps.

Service:

To service the milk carton trap, just open the pour spout, empty trap contents, and reclose the spout.

Before reclosing the spout, visually inspect the insecticidal strip and disparlure dispenser to make sure they are still in place.

HINT: Males may be stuck to the trap's bottom. A long stick can be used to dislodge them.

The steps for servicing traps for detection surveys begin on page 27, and for delimiting surveys the steps begin on page 37.

Black Light Trap

Materials:

- Black light trap, battery, and support
- Light bulb (1 replacement)
- Fuses (2 replacements)
- Sifting screens
- Vapona strips (1 replacement)
- Gypsy Moth Identification Work Sheets (GMIWS)
- Envelopes and boxes

Assemble:

Description--The attractant is a 22-watt black light tube mounted on clear acrylic vanes.

The collection container is a 5 gallon polypropylene bucket with an aluminum funnel to fit the lip of the bucket. The trap comes with ballast, photo switch, power cord with alligator clips for 12 volt DC operation, aluminum lid, and attaching cords.

Operation--Attracted insects strike the baffles and are stunned; then they fall through a large funnel, and finally drop into a collection container. This container includes another small funnel and two screens that are used to sift the insects by size, and minimize specimen damage.

Step 1--Assemble the black light trap according to manufacturer's instructions.

Step 2--Hang a Vapona strip on the inside of the collection container. Be sure to avoid direct contact with the chemical and avoid breathing the vapors.

HINT: Replace the strip every 2 months, or before if insects are not completely killed in a reasonable amount of time.

HINT: Always handle Vapona strips with gloves or with the foil pouch in which they were delivered.

Step 3--Place the small screen (1/4 inch mesh) in the bottom of the collection container. Place the large screen (1/2 inch mesh) on top of the bottom screen.

Step 4--Secure the collection container to the black light trap.

Set:

Consider the following general rules for setting black light traps.

1. The range of attraction to black light is no more than 200 feet for most insects. The best results occur when traps are placed where there is a 180 degree arch of visibility, within 200 feet of host trees.
2. Place in areas where there is minimal interference from other light sources. It would be desirable to place it 500 feet away from other sources of light.
3. Place near a light reflective surface to increase the pulling power of the light.
4. Place close to potential host trees adjacent to areas where incoming foreign ships are unloaded or handled.

5. Don't block the trap's range by screening it with interfering vegetation or structures. In other words, do not place the trap in the center of a clump of trees. The collection is reduced if the trap is obscured by buildings.

HINT: There is some indication that an obstruction such as a building to the west of the trap increases the collection. The reason is that some moths are attracted to the setting sun and are claimed to fly toward it. Therefore, it is possible that, when they are in flight, the building to the west blocks out the sun and the moths end up in the trap.

6. Place some distance from the edge of a clump of trees, and raise the light off the ground for increased effectiveness. A suggested location may be a flat roof top of a poorly lighted warehouse.

Service:

When--Service the trap daily. In the morning, retrieve any specimens and take the battery in for charging. In the evening, replace the battery and turn the light on.

Step 1--Release the collection container by unhooking the attaching cords.

HINT: Occasionally check for leaves, insects, and other debris in the rain catch pan. If it gets blocked, water will accumulate in the collection container.

Step 2--Empty the collection container using the following substeps as a guide.

1. Remove the funnel.
2. Remove the top screen.
3. Remove the bottom screen.
4. Remove any remaining insects and debris from the bottom of the container.
5. Put back the insecticidal strip that may fall out of the container.

HINT: Often it may be difficult to empty the collection container and visually search for suspect AGM at the trap site because of rain, wind, or other undesirable conditions. Therefore, you may elect to replace the collection container with an empty one at the trap site; then empty the full one and visually search for suspect AGM in a more secure environment such as the office.

Step 3--Once the collection container has been emptied or replaced, search the surrounding area for all life stages of AGM. Some insects will only come within a certain distance of a light and stop. AGM females are known to lay their egg masses around a light. Other brightly lighted surfaces such as billboards and walls are worth searching for egg masses.

If egg masses or female moths are found, then collect the specimen(s) and send to Otis Methods Development Center for identification. Refer to the steps for submitting AGM suspects, beginning on page 29.

Step 4--Visually search for suspect AGM males and females by sorting through the collection container. Use the identification card and pamphlets to help identify AGM male and female moths.

Carefully handle specimens collected from black light traps. It is critical to handle the specimens with extreme care because the specimens are extensively examined to determine the specific strain of gypsy moths.

HINT: Most gypsy moths are found on top of the screens.

Step 5--Separately place suspect AGM's in glassine or paper envelopes or place them together in a small paper bag. You can pin specimens, but don't spread the wings. Label the envelopes or paper bags with the date of servicing, the date of the last previous servicing, the trap number, and its location.

Step 6--Fill out a GMIWS. See instructions and an example under Appendix 4. Retain part 4. Send part 3 to an intermediate identifier, coordinator, or supervisor.

Step 7--Pack the remaining two parts of the GMIWS and specimens from one black light trap station in a sturdy, cardboard box. Mail the box to Otis Methods Development Center for identification.

Maintain:

Use the following troubleshooting checklist when a black light trap stops operating with no obvious physical damage or reason. If the black light trap will not operate because it was physically damaged by weather or vandalism, contact Otis Methods Development Center at Commercial 508-563-9303.

Step 1--Check that the power cord connection on the trap is tight.

Step 2--Check that the two power connections of the bulb are secure.

Step 3--Check that the power source end of the power cord is connected properly to the battery.

Step 4--Check that the trap fuse beneath the electrical box is not blown.

Step 5--Check that the bulb is not burnt out.

Step 6--Replace the starter in the electrical box.

Step 7--If the trap still does not operate after checking everything listed in Steps 1-6, contact Otis Methods Development Center at Commercial 508-563-9303.

APPENDIX 4
How to Complete Work Sheets

Introduction

Use this Appendix to help you complete a Gypsy Moth Identification Work Sheet (GMIWS). On page 4.3 is the proposed work sheet currently being approved by the Office of Management and Budget.

A work sheet must accompany specimens sent to Otis Methods Development Center for identification.

Instructions

| <u>Block Number</u> | <u>Directions</u> |
|---------------------|--|
| 1 | Record the date the specimen(s) is being sent to the Otis Methods Development Center. |
| 2 | Enter your name. |
| 3 | Enter your complete address, telephone number, and FAX number. |
| 4 | Check the appropriate submitting agency. If you check the "Other" box, write the agency next to the checked box. |
| 5 | Enter the date specimen(s) was collected from the trap. |
| 6 | Enter the date the trap was last checked before specimen(s) was collected. |
| 7 | Enter the trap number. |
| 8 | Enter the nearest U.S. port of entry (designated survey area). |
| 9 | Check the type of trap from which specimen(s) was collected. |
| 10 | Enter the location of the trap as described on a trap record sheet using an address, coordinates, or other descriptive directions. |

| <u>Block</u> | <u>Directions</u> |
|--------------|--|
| 11 | If possible, enter the number of suspect male gypsy moths collected from the trap. |
| 12 | If possible, indicate other life stages that may have been collected: egg masses, larvae, pupae, or adult females. |
| 13 | Use the Remarks block to record any pertinent observation of action taken. |
| 14 and 15 | Sign and date the work sheet. |
| 16 | Distribute the work sheet as follows: <ul style="list-style-type: none">a. Place the original (Otis Diagnostic Laboratory) and part 2 (Return to Submitter) in the box with the specimen(s).b. Send part 3 (Intermediate Identifier) to an intermediate identifier, a coordinator, or supervisor.c. Retain part 4 (Submitter). |

Public reporting burden for this collection of information is estimated to average 777 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Agriculture, Clearance Officer, OIRB, Room 404-W, Washington, D.C. 20250; and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, D.C. 20503.

FORM APPROVED -
OMB NO. 0670-XXXX

| U.S. DEPARTMENT OF AGRICULTURE ANIMAL AND PLANT HEALTH INSPECTION SERVICES PLANT PROTECTION AND QUARANTINE | | | | 1. DATE SENT |
|---|----------------------------|--|--------------------------|--------------|
| GYPSY MOTH IDENTIFICATION | | | | |
| 2. SUBMITTER'S NAME | | 3. SUBMITTER'S ADDRESS (Include Zip Code) | | |
| 4. SUBMITTING AGENCY <input type="checkbox"/> State <input type="checkbox"/> USDA <input type="checkbox"/> Other Federal agency | | Telephone No. () FAX No. () | | |
| TRAP DATA | | | | |
| 5. DATE COLLECTED | 6. DATE OF LAST TRAP CHECK | 7. TRAP NUMBER | 8. NEAREST PORT OF ENTRY | |
| 9. TRAP TYPE <input type="checkbox"/> Delta <input type="checkbox"/> Milk Can <input type="checkbox"/> Light Trap <input type="checkbox"/> Other | | | | |
| 10. TRAP LOCATION (Address or Coordinates, or Longitude/Latitude, or other) | | 11. NUMBER OF MALE GYPSY MOTHS IN TRAP | | |
| 12. REMARKS | | 12. OTHER LIFE STAGES COLLECTED (If submitted check appropriate boxes) | | |
| | | <input type="checkbox"/> Eggs <input type="checkbox"/> Larvae <input type="checkbox"/> Pupae <input type="checkbox"/> Female | | |

A

F

| | | | |
|---------------------------|--------------------|---|---------------|
| 14. SUBMITTER'S SIGNATURE | 15. DATE | 16. SEND TO: Ots Diagnostic Laboratory USDA, APHIS, PPQ Ots Methods Development Center Building 1398 Ots ANGB, MA 02542-5008 | |
| FOR LABORATORY USE ONLY: | | | |
| DATE RECEIVED | RESULTS | NO. OF EGGS | NO. OF ADULTS |
| | Wing Morphometrics | | |
| | mt DNA | | |
| | Other | | |

PPQ FORM XXX
(DRAFT)

APPENDIX 5

Reporting Asian Gypsy Moth Survey Data Into the National Agricultural Pest Information System (NAPIS)

Introduction

NAPIS is available to store and manage national-level data for Asian gypsy moth (AGM) survey. This data set consists of summary negative data and specific positive data. It shows the level of effort and results of the survey.

The survey manager, the OIC, and the State survey coordinator have joint responsibilities to insure that data are accurately input to NAPIS.

Enter one record per county to summarize negative results. Enter this after all survey data are complete, but not later than November 1, 1992.

Enter one record for each positive find.

The simplified NAPIS input format allows all necessary data to be contained in one record type. Directions for completing negative summary records and positive records follow. A data entry work sheet will be prepared and distributed.

Negative Find
Records

Input for Reporting AGM for 1992:

| <u>Block</u> | <u>Instructions</u> |
|----------------------|---|
| OBSERVATION NUMBER | (assigned by data manager, up to 9 digits) |
| OBSERVATION DATE | (date on which last traps were pulled YYYYMMDD) |
| DATA SOURCE | 11 (USDA-APHIS) or 13 (State agric. dept.) or 14 (university/extension) or 16 (PPQ in coop. w/State or university) |
| STATE COUNTY | (the five digit code for the State and county) |
| EPA SITE CODE | 29017 (trap survey) |
| CROP LIFE STAGE | n/a |
| CROP SITUATION | 29024 (detection survey) or 29025 (delimiting survey) or 29030 (eradication program) |
| LOCATION COORDINATES | n/a |
| EPA PEST CODE | ITAXQBA |
| PEST LIFE STAGE | I5 |
| PEST STATUS | - (negative) |
| SURVEY METHOD | 00001 (milk carton trap) or 00002 (delta trap) or 00525 (black light trap) or (other traps as needed) |
| QUANTIFICATION | 0 |
| DESCRIPTOR UNITS | 330 (traps) |
| TOTAL UNITS CHECKED | (number of traps checked in county per season) |
| POSITIVE UNITS | 0 |
| OBSERVATION DURATION | (number of days between setting of first traps and removing last traps in the county) |
| DIAGNOSTIC LAB CODE | 434 (Otis Methods Development Center, Massachusetts) |
| CONFIRMATION METHOD | 90100 (negative finds - electrophoretic mitochondrial DNA analysis) |
| BIOCONTROL TARGET | n/a |
| NOTES | (Enter any additional relevant information) |

Positive Find
Records

Input for Reporting AGM for 1992:

| <u>Block</u> | <u>Instructions</u> |
|----------------------|---|
| OBSERVATION NUMBER | (assigned by data manager, up to 9 digits) |
| OBSERVATION DATE | (date on which collection made YYYYMMDD) |
| DATA SOURCE | 11 (USDA-APHIS) or 13 (State agric. dept.) or 14 (university/extension) or 16 (PPQ in coop. w/State or university) |
| STATE COUNTY | (the five digit code for the State and county) |
| EPA SITE CODE | 29017 (trap survey) |
| CROP LIFE STAGE | n/a |
| CROP SITUATION | 29024 (detection survey) or 29025 (delimiting survey) or 29030 (eradication program) |
| LOCATION COORDINATES | (lat/lon coordinates, 13 digits) |
| EPA PEST CODE | ITAXQBA |
| PEST LIFE STAGE | I5 |
| PEST STATUS | +B (positive, not established) or +BC (pos., not established, begin- eradicating) |
| SURVEY METHOD | 00001 (milk carton trap) or 00002 (delta trap) or 00525 (black light trap) or (other traps as needed) |
| QUANTIFICATION | (number of moths caught in trap) |
| DESCRIPTOR UNITS | 330 (traps) |
| TOTAL UNITS CHECKED | 1 |
| POSITIVE UNITS | 1 |
| OBSERVATION DURATION | (number of days between setting trap and date of find) |
| DIAGNOSTIC LAB CODE | 434 (Otis Methods Development Center, Massachusetts) |
| CONFIRMATION METHOD | 90101 (positive finds - electrophoretic mitochondrial DNA analysis) |
| BIOCONTROL TARGET | n/a |
| NOTES | (Enter any additional relevant information) |

APPENDIX 6
LIST OF PORTS FROM THE HIGH RISK AREA

Introduction

Use this Appendix to match any listed port from the high risk area with those ports identified on a ship's itinerary. The high risk area is a range of maritime ports on the far east side of Russia from Posyet to Nikolayevsk.

This list is a partial listing compiled from the National Geographic, Atlas of the World. It will be updated to include maritime ports listed in the Lloyd's, Ports of the World.

| | |
|------------|------------------|
| High Risk | Amgu |
| Area Ports | Belembe |
| | Datta |
| | Grossevichi |
| | Innokent'yevskiy |
| | Kamenka |
| | Kastri |
| | Koppi |
| | Koz'mino |
| | Kuznetsovo |
| | Lazarev |
| | Maksimovka |
| | My |
| | Nakhodka |
| | Nel'ma |
| | Nikolayevsk |
| | Ol'ga |
| | Plastun |
| | Preobrazheniye |
| | Rudnaya Pristan' |
| | Samarga |
| | Sovetskaya Gavan |
| | Svetlaya |
| | Sudzukhe |
| | Terney |
| | Valentin |
| | Vanino |
| | Velikaya Kema |
| | Veselyy Yar |
| | Vladivostok |
| | Vostochny |
| | Zapovednyy |

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ASIAN GYPSY MOTH EMERGENCY PROGRAM MANUAL
Comment Sheet

Directions: Use this sheet to suggest an improvement or to identify a problem in the content of the manual. To mail, please follow the directions on the next page.

Description of problem (error, inconsistency, missing or insufficient information, etc.):

Description of improvement or recommended change (add attachments if necessary):

=====

Reason for the improvement or change:

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